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THE HOG CHOLERA SITUATION IN MICHIGAN

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The estimates of the U. S. Department of Agriculture indicate that 90 per cent of the deaths from infectious swine diseases in this country may be attributed to hog cholera. It is further estimated that the loss for 1913 totaled $78,000,000. It is probable that Michigan's share of this loss was about $1,000,000. In 1887 the loss per 1,000 hogs in the country was 120, and in 1897 it was 130 while in 1913 it was 100 per 1,000 hogs. It is predicted that the disease is now passing through another period of increase which means that we must expect greater losses for 1914.

It is quite clear that every swine raiser should be interested in protecting his hogs against hog cholera. Perhaps the best insurance against the disease at present is a thorough knowledge of the nature of the disease and how it is spread. In the first place hog cholera is an infectious disease and is therefore caused by a living germ and pri-

*If interested in a more complete treatise on the subject write for Special Bulletin No. 65, "Hog Cholera and Preventive Treatment."

marily by nothing else. The germ of hog cholera is much smaller than the ones that cause typhoid fever or tuberculosis, as a matter of fact it cannot be seen by the magnification of the most powerful microscope. Much has yet to be learned about this germ before its habits are thoroughly understood. So far as is known, the hog cholera germ grows only in the body of the pig. Therefore it causes the disease to appear only in swine and, since it cannot be grown in the laboratory it is not easily studied. The germ gets into the hog probably by way of the mouth and through skin abrasions. If it enters through the respiratory system it is probably greatly weakened by drying. It leaves the body of the sick hog by the feces and urine and all parts of the dead hog are capable of carrying the infection since the germs are in the body juices.

The symptoms of hog cholera are not constant but are quite variable in different outbreaks. One or more of the following symptoms may be observed in cases of cholera first, a rise of temperature, which can be determined by the thermometer only, and which may reach a point of 104° to 108° or more. Soon there appears a lack of appetite and thirst indicated by drinking the liquid portion of the swill. Later there is dullness and a disposition to stay in the bedding much of the time. The ears and tail droop, the pig becomes weak and staggers when walking and loses flesh rapidly, while the coat shows signs of unthriftiness. The bowels may be constipated, then loose, with perhaps streaks of blood in the discharges. Coughing and nasal discharges may be present or absent, usually the skin over the belly and ears turns reddish or purple as a result of blood disturbances and there may be a discharge from the eyes. The pig may die in convulsions within a few hours, or quietly in from three to five days after signs of sickness appear or not until a much later date. It must not be forgotten that some cases recover.

The diagnosis of cholera should be made only after studying the outbreak from all sides. The examination of the pig after death may be more instructive than a study of the symptoms. The diseased conditions vary at post mortem examination as much as do the symptoms before death. In a fatal acute case of cholera there are usually hemorrhages in the kidney varying in size from a mere point to great blotches and varying in numbers from a very few to countless numbers, or they may be so extensive as to coalesce. The lymph nodes are usually enlarged and more or less reddened as a result of hemorrhage. Hemorrhages may also occur on the surface of the lining of the intestines and on the lungs and heart. In chronic cholera there are usually raised button-like ulcers in the cecum and large intestines. In many of these cases the lungs are affected with pneumonia or accumulations of pus and the lungs may be adherent to the inner wall of the chest cavity or thorax. *These conditions are to be attributed to secondary infections and not to the hog cholera germ.*

Hog owners should not be misled by statements to the effect that hogs are affected with infectious pneumonia, swine plague, pig typhoid or some other equally indefinite trouble rather than with hog cholera.

It is safest to recognize the disease as hog cholera in most cases and proceed accordingly, by consulting a qualified veterinarian.

Every effort should be put forth to completely eradicate cholera from Michigan. This will be accomplished more readily and perhaps only by the individual efforts of all concerned. It is much easier to prevent the spread of cholera from the affected herd than it is to protect the non-affected herds from infection. Hog cholera spreads in about one-third of the cases by visiting between infected and non-infected herds, by exchanging work and other similar neighborly practices. Probably in one-fourth of the cases it is spread by birds and in one-tenth by purchasing new stock. In other cases it is spread by dogs, streams, and by infected stock yards. It will be seen that a large percentage of cases may be spread to remote premises by agencies so consituted that they travel long distances. Logically, then, it is better to prevent the infection from spreading by attacking it at its source.

In order to eradicate, or at least to control the cholera, we would, therefore, recommend that the affected herd be immediately confined in such a manner that no one, and no dog or bird could have free access to the hogs. It would be best to immediately destroy the sick hogs and all dead hogs should be burned to ashes. If burning is not possible, rendering at a suitable plant (soap grease or fertilizer) or deep (covered four feet) burial with fresh-burned lime is advisable. This should be done immediately and not at the owner's convenience. The premises should be quarantined by the owner by placing cards warning people to stay away from the hog lots and those that come in contact with the affected herd should stay away from healthy herds. Stray dogs, pigeons, crows, buzzards and sparrows should be excluded as far as possible.

To prevent the spread of the disease in the herd, hog cholera serum should be used immediately on all the healthy hogs in the herd. In attempting to determine the health of the hogs the clinical thermometer should be used. Serum is a preventive and should not be expected to cure sick hogs or those with a temperature above 104°. In every case, after the hogs are treated, the premises should be thoroughly cleaned and disinfected, all litter should be burned. Yards and pens should be sprinkled thickly with fresh burned lime. A 3 to 5 per cent solution of compound solution of cresol is recommended. It must be remembered that disinfection cannot be accomplished until the place is rendered clean. It would be better in certain cases to completely destroy the hog pens. The premises may in most cases be considered safe 90 days after they have been properly disinfected and after the last case of cholera has been destroyed. The disease should not recur on such premises unless it be introduced from without.

What can be done with the serum to protect the surrounding herds? Probably if precautions were taken to prevent the spread of cholera as carefully as are taken in the case of small pox in man, the disease would not be so dangerous to surrounding herds. Unless steps are taken as indicated above, cholera will not be eradicated or controlled by the use of serum. The use of serum and virus is not recommended

because of the danger of its producing the disease in cholera-free herds. The serum alone treatment may be used with safety and its use will offer short protection, but long enough to guard the pigs against cholera if the infected premises are properly quarantined, cleaned and disinfected.

No progress can be expected so long as the serum treatment alone is relied upon for relief. *Only by the observance of all the precautions usually taken to prevent the spread of contagious diseases of man can we hope to get rid of this plague of the swine industry.* It must be remembered that hog cholera is one of the most contagious of all communicable diseases and that it is more difficult to control the discharges of sick animals than of human beings. Therefore, since the control of the disease depends upon preventing the spread of the germs in the discharges, it is evident that even greater care must be taken in handling the diseases of the lower animals than those of man if we wish to eradicate the disease. We cannot hope to immunize all the hogs in the country. This would require more serum and labor than can be made available and the expense would be too great. We must, therefore, destroy the cholera germ.

We believe that the cholera situation can be greatly improved in Michigan by individual effort along the lines mentioned herein and by proper cooperative efforts of the local authorities (supervisors and local health boards), County Agriculturists, Live Stock Sanitary Commission, Agricultural Experiment Station and U. S. Department of Agriculture.

When ordering serum compute the total amount from the following table.

Weight of Pig.	Dose of serum.	Dose of virus.
Sucking pig	15 cc.	.2 cc.
30 to 50 lbs.	20 cc.	.25 cc.
50 to 75 lbs.	25 cc.	.5 cc.
75 to 100 lbs.	30 cc.	.75 cc.
100 to 125 lbs.	35 cc.	1. cc.
125 to 150 lbs.	40 cc.	1.2 cc.
150 to 175 lbs.	45 cc.	1.5 cc.
175 to 200 lbs.	50 cc.	1.5 cc.
200 to 225 lbs.	55 cc.	1.5 cc.
225 to 250 lbs.	60 cc.	1.5 cc.
250 to 275 lbs.	65 cc.	1.5 cc.
275 to 300 lbs.	70 cc.	1.5 cc.
300 to 325 lbs.	75 cc.	1.5 cc.
325 to 350 lbs.	80 cc.	1.5 cc.
350 to 375 lbs.	85 cc.	1.5 cc.
375 to 400 lbs.	90 cc.	1.5 cc.
400 to 425 lbs.	95 cc.	1.5 cc.
425 to 450 lbs.	100 cc.	1.5 cc.
450 to 475 lbs.	105 cc.	1.5 cc.
475 to 500 lbs.	110 cc.	1.5 cc.
500 to 525 lbs.	115 cc.	1.5 cc.
525 to 550 lbs.	120 cc.	1.5 cc.
Over 550 lbs. add 5 cc. serum for every 25 lb. wt. Do not increase dose of virus.		

Address all communications relative to hog cholera and serum, and other infectious diseases, to the Bacteriological Laboratory, East Lansing, Michigan.